WQB "Wide Aperture Quad" for Main Injector

14 April 2005, 9:00 AM
IB2 conference room, ICB2W Conference Room, and IB4 Training Room

Attendees: Linda Alsip, Bruce Brown, John Carson, Weiren Chou, TJ Gardner, Camille Ginsburg, Hank Glass, Dave Harding, Vladimir Kashikhin, Linda Valerio

Beam tubes

A short sample of round beam tube arrived last week and has been checked for permeability. The specification for the unformed tube was <1.01 for the base material and less that 101% of the base for the welded seam. The material was measured to be <1.01 and the seam to be between 1.01 and 1.02, so that is good.

The first tube arrived on site by air freight late yesterday and is now in IB4. (During the group's second move we took time to admire it.) The dimensions, permeability, and vacuum tightness will be checked.

The rest of the tubes have been formed and are being shipped by truck, along with the checking fixture we provided to the vendor.

Fabrication

The first four trim coils have been wound and are ready to be wrapped in with the main coils. Small pieces of tooling and materials have been acquired to ensure that the trim coils go in the right place and that all spaces are filled with fiberglass. The potting mold is ready to receive the first two coils.

The core stacking fixture issues have been resolved and the first quarter core is ready to be welded. (On the subsequent tour we found the welder receiving instruction on the procedures and weld patterns required.)

The current schedule shows some improvement from two weeks ago, but assumes that assembly of WQB002 starts concurrent with testing of WQB001.
First article to MTF 23 May
First magnet available for installation 25 June
Fourth magnet available for installation 4 August
Seventh magnet ready for installation 7 October

Design

The water and power connection will be the same as for the Main Injector quadrupoles, in as close to the same location as possible to minimize adjustment in the tunnel. We need to be careful in trying to match the magnet polarity. Linda needs the interface drawing that has been promised showing the magnet as a block and all of the connection points. The trim coil connections have not been specified. Dave will check with Leon. We expect that they should be covered to allow tunnel access without locking out the power supplies. No one knew whether Dave Johnson had talked with Alignment. John Carson has the flange-to-flange dimension. Jim Fitzgerald is working on the BPM's.

The tooling for trying to swage the 4Q120 beam tube back to round should be out of the shop tomorrow.

Measurement and refinement plan

Hank plans to use a standard Morgan coil, one of the ones usually used on Main Injector quadrupoles. The nominal diameter is 2.75". On the first magnet we will measured the harmonics at several x positions to cover the whole aperture. A larger diameter probe, the Morgan coils designed for the P-Bar small quadrupoles, would fit and might be interesting for cross-calibration, but would not extend through the whole length of the magnet. A hysteresis study will be performed on a later magnet. The center of the first two or three magnets will be determined with the single wire stretched wire system. Only if there is a variation from the expected geometrical center, will we will measure the rest.

The field should be measured with the trim coil for the sake of verifying that it is wired correctly. Detailed measurements with both coils powered are not useful, as we firmly believe that the effect of one Ampere-turn is independent of which coil the current flows in.

Next meeting

Weiren suggested that Leon Bartelson and Jim Fitzgerald be invited to the next meeting for reports on the trim power supplies and BPM's, respectively.

Next meeting in two weeks: Thursday, 28 April 2005. 9:00 AM, IB2 Conference Room